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REMARKS

Reexamination and reconsideration of this application in view of the present response with amendment is kindly requested. By this amendment, Claims 6, 8, and 13, have been amended, and new Claims 41, 42, and 43, were added. After this response, Claims 1-15, and 40-43 remain pending in this application. No new matter was added by this amendment.

Claim Rejections - 35 USC § 112

The Examiner rejected Claims 6 and 8, under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter of the invention. Specifically, Claim 6 was rejected because a claim limitation including the term "carrier gas" and an instance of carrier gas being "nitrogen" was considered vague and indefinite. In similar fashion, Claim 8 was rejected because a claim limitation including the term "carrier material" and an instance of carrier material being "silicon" was considered vague and indefinite.

Applicants have amended Claim 6, and added new Claim 41, only to separate the recited carrier gas from the recited nitrogen as an instance of a carrier gas into two dependent claims. This should help make amended Claim 6, and new Claim 41, recite the carrier gas more clearly and definitely.

Further, Applicants have amended Claim 8, and added new Claim 42, only to separate the recited carrier material from the recited silicon as an instance of a carrier material into two dependent claims. This should help make amended Claim 8, and new Claim 42, recite the carrier material more clearly and affirmatively.

Lastly, Applicants have amended Claim 13, and added new Claim 43, only to separate the two ranges into two dependent claims. This should help make amended Claim 13, and new Claim 43, recite the two ranges more clearly and affirmatively.

The correction of the claim language in Claims 6, 8, and 13, and the addition of new Claims 41-43, was made only to help more clearly recite the invention, and not for patentability or to further limit the claims in view of any prior art. No new matter was added by these amendments.

Therefore, in view of the amendments and discussion above, Applicants believe that the rejection of Claims 6 and 8, under 35 U.S.C. 112, second paragraph, has been overcome. Applicants request that the Examiner withdraw the rejection of these claims. Also, Applicants believe that the amendment to Claim 13, and the added new Claim 43, places these claims in more proper form. Applicants request that the Examiner accept these amendments and withdraw the rejection of Claims 6 and 8.

Claim Rejections - 35 USC § 102 (b)

The Examiner rejected Claims 1-5 and 8, under 35 U.S.C. 102(b) as being anticipated by the publication CHIU Chemical Vapor Deposition 200, 6, No 5, page 223-225, (hereinafter referred to as "Chiu").

The Examiner cites 35 U.S.C. § 102(b), and a proper rejection requires that a single reference teach (i.e., identically describe) each and every element of the rejected claims.[1]

Applicants respectfully traverse the Examiner's rejection of Claims 1-5 and 8 under 35 U.S.C. 102(b). Applicants assert that Chiu does not teach, anticipate, or suggest, *inter alia*,

[1] See MPEP §2131 (Emphasis Added) "A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). "The identical invention must be shown in as complete detail as is contained in the ... claim."

heating carrier material to a heating temperature of between approximately 200°C and 400°C; and

circulating a gas mixture comprising tert-butyliminotris (diethylamino) tantalum (t-BuN=Ta(NEt_2)$_3$) in contact with the heated carrier material under an oxidizing atmosphere thereby forming a layer of tantalum pentoxide (Ta_2O_5) on the carrier material, the partial pressure of the tert-butyliminotris (diethylamino) tantalum being greater than or equal to 25 mTorr,

as recited for independent Claim 1, and for all dependent claims depending therefrom.

Analysis Of The Present Claims In View Of Chiu

First, please note that the new cited document from CHIU (**Polyhedron Vol. 17, Nos 13-14, pp.2187-2190, 1998**) does not appear to be used by the Examiner in the rejections of the claims. In any case, this new document is not relevant at all to the claimed invention.

In the Office Action, the Examiner asserts that the other CHIU document (**Chemical Vapor Deposition 200, 6, No 5, page 223-225**) would disclose the pressure and temperature conditions claimed by the present patent application. From this point, further references to the CHIU document will refer to the document published in **Chemical Vapor Deposition 200, 6, No 5, page 223-225**.

According to the Examiner, the CHIU document would disclose, p 225 column 1, a deposition performed under a total pressure of 1 Torr and with a temperature comprised between 573K and 873K.

From those data, the Examiner affirms that one of ordinary skill in the art would have trivially obtained the information that the TBTDET partial pressure must be below 50mTorr.

This conclusion is totally wrong, and the reasoning used to arrive at the conclusion is also wrong.

To get to this result, the Examiner uses the relationship P1V1 + P2V2 = PV, where suffix 1 refers to parameters relative to the mixture of TBTDET/Ar and suffix 2 refers to parameters relative to Oxygen.

The different steps of the Examiner's calculations are not disclosed. Only the following results are written out.

P1 = V1 / (V1 ÷ V2) and P2 = V2 / (V1+V2), wherein V1 and V2 are substituted by their respective values.

The Examiner concludes with a statement in which, given the mass of TBTDET is higher than the mass of Ar, the major part of partial pressure P1 must be attributed to TBTDET. The Examiner also asserts that one of ordinary skill in the art would have estimated that more than 50% of the partial pressure P1 is due to the TBTDET. The result is a TBTDET partial pressure of 50mTorr.

It is clear that this calculation is wrong.

Since the volumes V1 and V2 are not disclosed, the Examiner assumes that the volume V1 equals the gas flow of oxygen and that the volume V2 equals the gas flow of the mixture of TBTDET and Ar. In microelectronics processes and especially in deposition processes, the volumes are generally much higher than the product of gas flows by time of renewal of said volumes. The assumption of the Examiner is wrong.

Pressures P1 and P2 are defined as partial pressures. A partial pressure is an abstraction used to figure out the volume a gas part of a mixture of gases would occupy if said gas would be alone in the volume occupied by said mixture of gases. In the present case, this definition of a

partial pressure implies that volumes V1, V2, and V are equal, if pressures P1 and P2 are partial pressures. The Examiner's reasoning in this step is also wrong, because the previous assumption made was that V1 and V2 were different, each of them being equal to the respective gas flows.

The Examiner asserts that the mass of TBTDET is heavier than the mass of Ar. The imprecise wording used can lead one to think that the Examiner is using molar masses, even more as no actual masses are mentioned in the CHIU document.

This fact points out another error of the Examiner, as there is no relationship between the ratio of molar masses of gases and their relative proportion in a mixture. To further enforce this fact, recall that one mol of a gas occupies a volume independent of the nature of the gas. For reference, the standard volume of a mol of gas under normal temperature and pressure in the approximation of the perfect gases is 22.4 l/mol. The masses or molar masses, taken alone, have no impact on the partial pressure of TBTDET. Only the quantity of matter, through the number of mol of the different gases is of any interest in the determination of the partial pressure of TBTDET.

Moreover, in the TBTDET/Ar mixture, the Ar is a carrier gas. This means it is chemically neutral in the process and is used to carry over the TBTDET. This implies that the volume of Ar is much higher than the volume of TBTDET, so that the momentum of Ar is partially transferred to TBTDET without slowing the mixture as a whole. Therefore, the sole fact that Ar is a carrier gas defeats the argument of the Examiner, concerning the fact that more than 50% of the pressure of the TBTDET/Ar mixture is due to the TBTDET, since most of the TBTDET/Ar mixture must be made of Ar.

As a conclusion, it is impossible to determine the partial pressure of TBTDET out of the information disclosed by the CHIU document.

Furthermore, Applicants stress again that it is the combination of the use of TBTDET as a precursor, of the heating of the carrier material between 200 and 400°C, and of a partial pressure

of TBTDET of at least 25mTorr, that enables the deposition of a good quality Ta_2O_5 film, as claimed.

Accordingly, in view of the discussion above, it is clear that CHIU neither discloses, anticipates, nor suggests, the combination of process steps as claimed in Claim 1. All of the dependent claims, including dependent Claims 2-5 and 8, recite the language in the independent Claim 1, and therefore are also allowable for at least the same reasons as discussed above in support of the patentability of Claim 1. The Examiner should withdraw the rejection of the Claims 1-5 and 8, under 35 U.S.C. 102(b), and allow these claims, and also all the other claims in the application, to issue in a U.S. patent.

Claim Rejections - 35 USC § 103

The Examiner rejected Claims 6-7, 9-15, and 40, under 35 U.S.C. 103(a) as being unpatentable over publication CHIU Chemical Vapor Deposition 200, 6, No 5, page 223-225, (hereinafter referred to as "CHIU").

The Examiner cites 35 U.S.C. §103. The Statute expressly requires that obviousness or non-obviousness be determined for the claimed subject matter "as a whole," and the key to proper determination of the differences between the prior art and the present invention is giving full recognition to the invention "as a whole." To establish prima facie obviousness of a claimed invention, all of the claim limitations must be taught or suggested by the prior art. In re Royka, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). "All words in a claim must be considered in judging the patentability of that claim against the prior art." In re Wilson, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970).

The Examiner recognized that the cited reference fails to teach nitrogen as a carrier gas. However, the Examiner concluded that it is well known that carrier gases can comprise nitrogen gas. Also, the Examiner concluded that it would have been obvious to substitute nitrogen for argon as the carrier gas with the expectation of obtaining similar results. See Office Action, page

4.

Applicants respectfully traverse the Examiner's rejection of Claims 6-7, 9-15, and 40 under 35 U.S.C. 103(a). Applicants assert that CHIU does not teach, anticipate, or suggest, *inter alia*,

heating carrier material to a heating temperature of between approximately 200°C and 400°C; and

circulating a gas mixture comprising tert-butyliminotris (diethylamino) tantalum (t-BuN=Ta(NEt_2)$_3$) in contact with the heated carrier material under an oxidizing atmosphere thereby forming a layer of tantalum pentoxide (Ta_2O_5) on the carrier material, the partial pressure of the tert-butyliminotris (diethylamino) tantalum being greater than or equal to 25 mTorr,

as recited for independent Claim 1, and for all dependent claims depending therefrom.

The presently claimed invention is directed at **the combination** of a vapor phase deposition process of tantalum pentoxide from TBTDET organometallic precursor at low temperature (**between approximately 200°C and 400°C**), under high TBTDET **partial pressure** (**greater than or equal to 25 mTorr**) allowing the deposition of good quality tantalum pentoxide layers. CHIU fails to teach or suggest this claimed combination, as has been discussed above. While equally applicable to the present analysis, Applicants will not repeat here the same arguments and reasons already presented above with respect to the rejection of Claims 1-5 and 8.

Therefore, Applicants believe that the CHIU document neither discloses nor suggests the presently claimed invention, as recited for Claim 1, and for all of the dependent claims depending therefrom, including Claims 6-7, 9-15, and 40.

Accordingly, in view of the remarks above, since CHIU, does not teach, anticipate, or suggest, the presently claimed combination of process steps as recited for independent Claim 1, and for all of the dependent Claims 2-15 and 40-43, that depend from the independent claim,

Applicants believe that the rejection of Claims 6-7, 9-15, and 40, under 35 U.S.C. 103(a) has been overcome. The Examiner should withdraw the rejection of these Claims 6-7, 9-15, and 40, and allow all of the Claims 1-15 and 40-43 to issue in a U.S. patent.

Conclusion

The foregoing is submitted as full and complete response to the Official Action mailed July 20, 2007, and it is submitted that Claims 1-15 and 40-43 are in condition for allowance. Reconsideration of the rejections is requested. Allowance of Claims 1-15 and 40-43 is earnestly solicited.

No amendment made was related to the statutory requirements of patentability unless expressly stated herein. No amendment made was for the purpose of narrowing the scope of any claim, unless Applicants have argued herein that such amendment was made to distinguish over a particular reference or combination of references.

Applicants acknowledge the continuing duty of candor and good faith to disclose information known to be material to the examination of this application. In accordance with 37 CFR § 1.56, all such information is dutifully made of record. The foreseeable equivalents of any territory surrendered by amendment are limited to the territory taught by the information of record. No other territory afforded by the doctrine of equivalents is knowingly surrendered and everything else is unforeseeable at the time of this amendment by the Applicants and the attorneys.

If the Examiner believes that there are any informalities that can be corrected by Examiner's amendment, or that in any way it would help expedite the prosecution of the patent application, a telephone call to the undersigned at (561) 989-9811 is respectfully solicited.

The present application, after entry of this response, comprises nineteen (19) claims, including one (1) independent claim. Applicants have previously paid for thirty-nine (39) claims including three (3) independent claims. Applicants, therefore, believe that a fee for claims amendment is currently **not** due.

A petition for extension of time to file this Response is hereby incorporated herein. The Commissioner is authorized to charge the appropriate fee amount to prevent this application from becoming abandoned, to Deposit Account **50-1556**.

The Commissioner is hereby authorized to charge any fees that may be required or credit any overpayment to Deposit Account **50-1556**.

In view of the preceding discussion, it is submitted that the claims are in condition for allowance. Reconsideration and re-examination is requested.

Respectfully submitted,

Date: December 20, 2007

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